

REMARKS

Claims 20, 25-32, 35 and 36 are stated in the Office Action to be the claims to be examined as the elected species in the present application. Claim 25 is stated to be generic in the Office Action.

Applicant respectfully notes that it was stated that: "Claim 20 appears to be generic" in the Office Action dated November 11, 2000, but subsequently in the Office Action dated April 5, 2001, it is stated to read on the elected species. No explanation of this inconsistency is presented and applicant respectfully requests that an explanation be provided as to why claim 20 is now not deemed to be generic in the next Office Action. For example, Claim 20 contains the generic language "at least one illumination channel."

I. Claims 20 and 29 stand objected to for antecedent basis reasons.

Applicant has corrected claims 20 and 29 as per the Examiner's suggestions. Applicant thanks the Examiner for noting these points.

II. The 112 rejections of claim 26, 28, 30-32.

Claim 26 has been put in Markush format.

New claims 41-43 have been added to overcome the rejections of claims 30 and 31.

Claim 28 has been amended for antecedent basis reasons.

Claim 32 has been amended to clarify that one zoom system is claimed in claim 32.

III. The claimed invention of independent claim 20 is not anticipated by DE 4331653 (Sander) because as amended claim 20 incorporates the limitation "the light conductor extends at least partially in the interior of the microscope." from claim 27.

As amended, Claim 20 claims:

20. (Once Amended) An illumination arrangement for a stereo microscope, in particular, a Greenough type stereo microscope with adjustable magnification, comprising:
at least one illumination channel [which is] arranged in a plane which is arranged essentially orthogonally with respect to [the] a plane of the two observation [channel] channels wherein the illumination direction is carried out at an angle to the optical axis of the microscope by means of least one light conductor wherein the light conductor extends at least partially in the interior of the microscope housing and the light conductor is guided around the observation optics and the maximally visible object field is illuminated.

The amendments to claim 20 are at least supported by original claims 24 and 27 and the specification. Therefore, no new matter has been added.

At page 5 (bottom) of the Office Action, Claim 27 is stated to not be anticipated by Sander. Therefore, as claim 20 incorporates the limitations of Claim 27, claim 20 is not anticipated.

Claim 27 is cancelled.

Claims 25, 28, and 29 depend from claim 20 are therefore also allowable.

IV. The obviousness rejections of claims 26, 27 and 36 in view of Sander. Claim 20 is not obvious in view of Sander because no light conductor is disclosed rather a light deflector is disclosed, and said light deflector is not in the same orthogonal arrangement and it is not located substantially in the microscope. Also under MPEP 2144.03 a reference should be cited to show what is alleged to be well known in the art.

The illumination arrangement in Sander, DE 4331653 differs from the arrangement claimed in claim 20 above in principle and independent from the number of illumination channels.

Specifically, in Sander, DE 4331653, the illumination light is coupled in via deflecting

elements is located front of the main objective, i.e., the deflection element is not a light conductor (for example a fiber optic cable), it is light reflector which is a totally different structure from the light conductor as claimed in claim 20.

Also, the light deflector/reflector in Sander is also located substantially outside the optics of Sander's microscope and is not guided around the observation optics because the illumination channel in Sander is structurally located separated from the observation optics, i.e., structurally in front and substantially outside of the observation optics and therefore not "wherein the light conductor extends at least partially in the interior of the microscope housing and the light conductor is guided around the observation optics" as claimed in claim 20.

This makes sense because Sander discloses a lighting arrangement for a surgical microscope with observation tubes coupled optically and mechanically which are for one main observer and at least one co-observer and whose observation ray paths (in a telescope construction, and not in the Greenough construction) pass through a shared main objective, with one or more deflecting elements arranged in the illumination ray path, the illumination arrangement mainly serving for the optimization of the so-called "red reflex" (interaction between eye and illumination light, important for certain types of eye surgery).

In contrast, in the arrangement according to claim 20, the light conductors are structurally located to be "guided around the observation optics" and structurally located in the stereo microscope body, i.e., "conductor wherein the light conductor extends at least partially in the interior of the microscope housing" in a the Greenough construction (Greenough not disclosed by Sander),

and are arranged around the two observation channels orthogonal to the observation channels. Fig 2. of Sander does not show this orthogonal arrangement because observation channel 12b is not orthogonal to the illumination channel alleged to be shown by 5b. This is because 12b is located next to observation channel 13a and not 5b so it is not orthogonal to 12b for example.

In summary, in the operation of the microscope according to Sander, DE 4331653, a structural arrangement with light deflected in the deflecting elements is arranged in front of the main objective (in the object space) is disclosed.

After the deflecting elements, the light is guided via the (imaging) main objective into the object space. Accordingly, there is no overlap with the arrangement according to claim 20 in which the illumination light transmitted to the object field to be illuminated via light channels is directed without deflection elements, i.e., directly via light conductors and imaging optics as best seen in the figures of the present invention.

For the reasons above, claim 20 is not believed to be taught or suggested by Sander which teaches a totally different structure with light deflectors located separated from the observation optics and not guided around the observation optics as claimed. Thus, Sander also does not teach all of the limitations of claim 20. Therefore, without a hindsight analysis, it is respectfully asserted that one skilled in the art could not develop the invention of claim 20 in view of Sander.

Also, in regard to page 5 and 6 of the Office Action, under MPEP 2144.03, a reference should be cited to show what is alleged to be well known in the art in regard to claims 27 and 36 because applicant respectfully "seasonably challenges" said assertions herein.

Claims 27 and 36 depend from claim 20 and are also therefore believed to be allowable.

Additionally in regard to the dependent claims, **no** coupling of the fiber-optic illumination into **deflection elements** and then into the (image forming) **main objective** is done in the arrangement according to the claimed invention. Rather, the illumination of the object space is done via at least one light conductor (claims 20, 25) **directly** by the ends of the light conductors (claim 28) or by special illumination optics (claim 29). *not in claims*

Further, in claim 26, the embodiment of the light conductor as a glass, plastic or liquid conductor is described for the arrangement described in specific terms, in claim 27, the type of light conductor installation is described, and in claim 36 the external light conductor connection to a cold light source is described.

Again, the aforementioned direct coupling of light into special illumination optics means that deflection elements and a main objective coupling are purposefully not used-and this claimed structure avoids reflections in the observation optics and therefore leads to a much higher image quality for critical objects (for example highly reflective metallic surfaces).

Sander makes no statement about the type of light conductor, its installation inside the instrument or about coupling in the light by means of external or integrated light sources.

There is therefore no coincidence with the arrangement according to the invention for which the illumination light is directed onto the object field to be illuminated without any deflecting elements and preferably directly through image forming optics.

V. The obviousness rejections of claims 30-32 in view of Sander and Takagi US 5,140,458.

Takagi describes an optical system in which the observation optics and illumination optics are coupled and driven by a motor. A one-channel optical observation system, not shown in more detail, and an illumination system which is illuminated via an incandescent lamp directly and **not via light guides**. Therefore, the disclosed structure is totally different from claim 20.

Claims 30 to 32 according to the invention describe **a light guide illumination system which can be adjusted manually or via motor** and which can be moved synchronously with the observation system (claim 30). Since all of the above-mentioned claims according to the invention are tailored to illumination **via light guides** on the **arrangement of a stereo microscope**, there is no overlap of subject matter with U.S. 5,140,458.

Therefore, Takagi does not respectfully make up for the deficiencies of Sander, and does not render the claims obvious.

For the Examiner's general information applicant also notes the following:

In regard to the positioning of the illumination channels such that no direct light enters the observation channel:

As is shown in Fig. 1, the observation channels and illumination channels are orthogonal to one another. When zooming the optical zoom system or switching a discrete magnification changer (changing the magnification of the two observation channels), object fields of various sizes are visible at different beam inclinations.

The illumination optics are inclined at an angle (see Fig. 4) such that the maximum visible object field is completely illuminated, but the illumination cone (likewise **inclined** illumination beams) impinging orthogonal to the inclined observation beams lies outside the observation beam

inclinations and observation beam directions after its reflection in the object plane, i.e., it cannot be seen by the observer (preventing risk of blinding with highly-reflective specimens).

In this citation, an **optical system** is described where the **observation and illumination optics** are **coupled** with each other and **motorized**. Here, the optical observation system not described in any detail has **one channel** and the **illumination system** is illuminated **directly** by means of a **light bulb** and **not** by means of a light conductor. The main claims are directed to the **manner** in which the observation and illumination system **are coupled**.

In claims 30 - 32 according to the invention and based on the preceding claims (adaptation to the special properties of a stereomicroscope), a **light conductor/illumination system** is described which **can be adjusted manually or driven by a motor** and which can also be moved synchronous to the observation system (claim 30). Since all the aforementioned claims with respect to the illumination through light conductors are adapted to **the arrangement of a stereomicroscope**, no coincidence with US 5,140,458; Takagi et al., is recognized.


VI. New claims 40-44 have been added. no new matter has been added. It is respectfully requested that these claims be considered.

VII. Conclusion

In light of the *FESTO* case, no claim amendment or argument made herein was related to the statutory requirements of patentability unless expressly stated herein. No claim amendment or argument made was for the purpose of narrowing the scope of any claim unless Applicant has explicitly stated that the argument is "narrowing."

Therefore, for all of the reasons above the rejections are believed to be respectfully traversed. Therefore, it is respectfully requested that the claims be reconsidered and allowed.

Respectfully submitted,



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MARKED-UP CLAIMS:

20. (Once Amended) An illumination arrangement for a stereo microscope, in particular, a Greenough type stereo microscope with adjustable magnification , comprising:

at least one illumination channel [which is] arranged in a plane which is arranged essentially orthogonally with respect to [the] a plane of the two observation [channel] channels wherein the illumination direction is carried out at an angle to the optical axis of the microscope by means of at least one light conductor wherein the light conductor extends at least partially in the interior of the microscope housing and the light conductor is guided around the observation optics and a maximally visible object field is illuminated.

26. (Once Amended) The illumination arrangement according to claim 25, wherein the light guide is selected from the group consisting of a flexible glass light guide, and [and/or] a plastic light guide, and [and/or] a fluid light guide.

27. Please cancel claim 27.

28. (Once Amended) The illumination arrangement according to claim 25, wherein the illumination is carried out via an end of the light guide [ends].

29. (Once Amended) The illumination arrangement according to claim 25,

wherein the illumination is carried out via illumination optics arranged following an end of the
light guide [end].

30. (Once Amended) The illumination arrangement according to claim 29,
wherein the illumination optics are arranged so as to be adjustable [and/or displaceable and/or
swivelable] with respect to the image scale as zoom system.

31. (Once Amended) The illumination arrangement according to claim 29,
wherein a [hand-actuated and/or] motor-operated control is provided for adjusting the
illumination optics.

32. (Once Amended) The illumination arrangement according to claim 29,
wherein, when the illumination optics are adjusted as [a] an illumination zoom system, the
adjustment being coupled to the adjustment of the microscope zoom system.

Please add the following new claims:

40. (New) An illumination arrangement for a stereo microscope, in particular, a Greenough type comprising:

a least one illumination channel arranged in a plane essentially orthogonal to the plane of the two observation channels, wherein the illumination is effected at an angle to the optical axis of the microscope by means of at least one light conductor so that no direct light falls into the observation channels and a fluorescence excitation is effected through the light conductor.

41 (New) The illumination arrangement according to claim 29, wherein the illumination optics are arranged so as to be displaceable with respect to the image scale as zoom system.

42. (New) The illumination arrangement according to claim 29, wherein the illumination optics are arranged so as to be swivelable with respect to the image scale as zoom system.

43.(New) The illumination arrangement according to claim 29, wherein a hand-actuated control is provided for adjusting the illumination optics.

44. (New) The illumination arrangement according to claim 20, wherein a fluorescence excitation is carried out via the illumination channel.